

WHAT IS CLAIMED IS:

1. A plasma processing apparatus comprising:

a plasma generating unit;
a process chamber capable of having an inside pressure thereof reduced;
a process gas supply unit for supplying gas to said process chamber;
a specimen table for holding a specimen; and
a vacuum pumping unit; and
a monitor unit;

wherein said process chamber includes an outer cylinder having the capability of withstanding a reduced pressure, and an inner cylinder arranged inside said outer cylinder; and

wherein said monitor unit enables monitoring of a temperature of said inner cylinder at least one of continuously and optionally at a time of processing of a specimen.

2. A plasma processing apparatus according to claim 1, wherein said processing apparatus further comprises an inner wall temperature setting unit for setting in advance a temperature of said inner cylinder corresponding to a plasma processing condition for the specimen, and a monitor temperature input unit.

3. A plasma processing apparatus comprising:

a plasma generating unit;
a process chamber capable of having an inside pressure reduced;
a process gas supply unit for supplying gas to said process chamber;
a specimen table for holding a specimen;
a vacuum pumping unit; and
a monitor unit;

wherein said process chamber includes an outer cylinder having the capability

of withstanding a reduced pressure and an inner cylinder arranged inside said outer cylinder; and

wherein said monitor unit enables monitoring of a temperature of said inner cylinder continuously for every one of a plurality of specimens until processing of the plurality of specimens is completed when the plurality of specimens are processed one by one in a continuous manner.

4. A plasma processing apparatus according to claim 3, wherein said processing apparatus further comprises an inner wall temperature setting unit for setting in advance a temperature of said inner cylinder corresponding to a plasma processing condition for the specimen, and a monitor temperature input unit.

5. A plasma processing apparatus comprising:

a plasma generating unit;

a process chamber capable of having an inside pressure reduced;

a process gas supply unit for supplying gas to the process chamber;

a specimen table for holding a specimen;

a vacuum pumping unit; and

a monitor unit;

wherein said process chamber includes an outer cylinder having the capability of withstanding a reduced pressure and an inner cylinder arranged inside said outer cylinder;

wherein said monitor unit enables monitoring of a temperature of said inner cylinder at a time of plasma processing for a specimen so that a history of the monitoring temperature up to an interruption of the plasma processing for the specimen is inputted and checked.

6. A plasma processing apparatus according to claim 5, wherein said

processing apparatus further comprises an inner wall temperature setting unit for setting in advance a temperature of said inner cylinder corresponding to a plasma processing condition for the specimen, and a monitor temperature input unit.

7. A plasma processing apparatus for plasma processing a specimen comprising:

- a plasma generating unit;

- a process chamber capable of having an inside thereof pressure reduced;

- a process gas supply unit for supplying gas to said process chamber;

- a specimen table for holding the specimen;

- a vacuum pumping unit; and

- a monitor unit;

wherein said process chamber includes an outer cylinder having the capability of withstanding a reduced pressure, and an inner cylinder arranged inside said outer cylinder;

wherein said monitor unit enables monitoring of a temperature of said inner cylinder during a seasoning operation when the seasoning operation is carried out in said process chamber.

8. A plasma processing apparatus according to claim 7, wherein said processing apparatus further comprises an inner wall temperature setting unit for setting in advance a temperature of said inner cylinder corresponding to a plasma processing condition for the specimen, and a monitor temperature input unit.

9. A plasma processing apparatus comprising:

- a plasma generating unit;

- a process chamber capable of having an inside pressure thereof reduced;

- a process gas supply unit for supplying gas to said process chamber;

a specimen table for holding a specimen;

a vacuum pumping unit; and

a monitor unit;

wherein said process chamber includes an outer cylinder having the capability of withstanding a reduced pressure, and an inner cylinder arranged inside said outer cylinder; and

wherein said monitor unit enables monitoring a temperature of said inner cylinder one of before starting plasma processing of a specimen and after finishing a cleaning operation of said plasma chamber.

10. A plasma processing apparatus according to claim 9, wherein said processing apparatus further comprises an inner wall temperature setting unit for setting in advance a temperature of said inner cylinder corresponding to a plasma processing condition for the specimen, and a monitor temperature input unit.

11. A plasma processing apparatus comprising:

a plasma generating unit;

a process chamber capable of having an inside pressure thereof reduced;

a process gas supply unit for supplying gas to said process chamber;

a specimen table for holding a specimen;

a vacuum pumping unit;

a cleaning unit; and

a monitor unit;

wherein said process chamber includes an outer cylinder having the capability of withstanding a reduced pressure, and an inner cylinder arranged inside said outer cylinder;

wherein said cleaning unit enables a cleaning operation of said process chamber under utilization of plasma for gas for cleaning at least one of before

plasma processing of a specimen, during the plasma processing for a plurality of specimens and after the plasma processing of the specimen; and

wherein said a monitor unit enables monitoring of a temperature of said inner cylinder after a cleaning operation and before starting the plasma processing for the specimen.

12. A plasma processing apparatus according to claim 11, wherein said processing apparatus further comprises an inner wall temperature setting unit for setting in advance a temperature of said inner cylinder corresponding to a plasma processing condition for the specimen, and a monitor temperature input unit.

13. A plasma processing apparatus comprising:

a plasma generating unit;

a process chamber capable of having an inside pressure thereof reduced;

a process gas supply unit for supplying gas to said process chamber;

a specimen table for holding a specimen;

a vacuum pumping unit;

a monitor unit; and

a plasma process interruption unit;

wherein said process chamber includes an outer cylinder having the capability of withstanding a reduced pressure, and an inner cylinder arranged inside said outer cylinder; and

wherein said monitor unit enables monitoring of a temperature of said inner cylinder; and

wherein said plasma processing interruption unit enables interruption of plasma processing for the specimen in response to the monitoring of the temperature of said inner cylinder.

14. A plasma processing apparatus according to claim 13, wherein said processing apparatus further comprises an inner wall temperature setting unit for setting in advance a temperature of said inner cylinder corresponding to a plasma processing condition for the specimen, and a monitor temperature input unit.

15. A plasma processing apparatus comprising:

a plasma generating unit;

a process chamber capable of having an inside pressure thereof reduced;

a process gas supply unit for supplying gas to said process chamber;

a specimen table for holding a specimen;

a vacuum pumping unit;

a cleaning unit; and

a monitor unit;

wherein said process chamber includes an outer cylinder having the capability of withstanding a reduced pressure, and an inner cylinder arranged inside said outer cylinder, and

wherein said cleaning unit enables a cleaning operation of said process chamber under utilization of a plasma for gas for cleaning during processing of a plurality of specimens when the plural specimens are processed one by one in a continuous manner; and

wherein said monitor unit enables monitoring of a temperature of said inner cylinder after the cleaning operation and before starting the plasma processing for the specimen.

16. A plasma processing apparatus according to claim 15, wherein said processing apparatus further comprises an inner wall temperature setting unit for setting in advance to input a temperature of the inner cylinder corresponding to a plasma processing condition for a specimen, and a monitor temperature input unit.

17. A plasma processing apparatus comprising:

a plasma generating unit;

a process chamber capable of having an inside pressure thereof reduced;

a process gas supply unit for supplying gas to said process chamber;

a specimen table for holding a specimen;

a vacuum pumping unit; and

an alarm unit;

wherein said process chamber includes an outer cylinder having the capability of withstanding a reduced pressure, and an inner cylinder arranged inside said outer cylinder; and

wherein said alarm unit enables generation of an alarm in response to a detected monitoring temperature for said inner cylinder.

18. A plasma processing apparatus according to claim 17, further comprising a monitor unit for monitoring temperature of said inner cylinder and providing an output of the detected monitoring temperature.

19. A plasma processing apparatus according to claim 18, wherein said processing apparatus further comprises an inner wall temperature setting unit for setting in advance a temperature of the inner cylinder corresponding to a plasma processing condition for a specimen, and a monitor temperature input unit.

20. A plasma processing apparatus comprising:

a plasma generating unit;

a process chamber capable of having an inside pressure thereof reduced;

a process gas supply unit for supplying gas to said process chamber;

a specimen table for holding a specimen;

a vacuum pumping unit; and

a monitor unit;

wherein said monitor unit enables monitoring of a temperature of an inner wall of said process chamber at least one of continuously and optionally at a time of processing a specimen.

21. A plasma processing apparatus according to claim 20, wherein said processing apparatus further comprises an inner wall temperature setting unit for setting in advance a temperature of said inner wall in response to a plasma processing condition for the specimen, and a monitor temperature inputting unit.

22. A plasma processing apparatus comprising:

a plasma generating unit;

a process chamber capable of having an inside pressure thereof reduced;

a process gas supply unit for supplying gas to said process chamber;

a specimen table for holding a specimen;

a vacuum pumping unit; and

a monitor unit;

wherein said monitor unit enables monitoring of a temperature of an inner wall of said process chamber continuously for every one of a plurality of specimens until the processing of plurality of specimen is completed when the plurality of specimen are processed one by one in a continuous manner.

23. A plasma processing apparatus according to claim 22, wherein said processing apparatus further comprises an inner wall temperature setting unit for setting in advance a temperature of the inner cylinder in response to a plasma processing condition for the specimen, and a monitor temperature inputting unit.

24. A plasma processing apparatus comprising:

a plasma generating unit;

a process chamber capable of having an inside pressure thereof reduced;

a process gas supply unit for supplying gas to said process chamber;

a specimen table for holding a specimen;

a vacuum pumping unit; and

a monitor unit;

wherein said monitor unit enables monitoring of a temperature of an inner wall of said process chamber at a time of plasma processing of the specimen so that a history in which the monitor temperature up to an interruption of the plasma processing for the specimen is inputted and checked.

25. A plasma processing apparatus according to claim 24, wherein said processing apparatus further comprises an inner wall temperature setting unit for setting in advance a temperature of the inner wall in response to a plasma processing condition for the specimen, and a monitor temperature inputting unit.

26. A plasma processing apparatus for performing a plasma processing of a specimen by a plasma processing apparatus comprising:

a plasma generating unit;

a process chamber capable of having an inside pressure thereof reduced;

a process gas supply unit for supplying gas to said process chamber;

a specimen table for holding a specimen;

a vacuum pumping unit; and

a monitor unit;

wherein said monitor unit enables monitoring of a temperature of an inner wall of said process chamber during a seasoning operation when the seasoning operation is performed in said process chamber.

27. A plasma processing apparatus according to claim 26, wherein said processing apparatus further comprises an inner wall temperature setting unit for setting in advance a temperature of the inner wall in response to a plasma processing condition for the specimen, and a monitor temperature inputting unit.

28. A plasma processing apparatus comprising:

a plasma generating unit;

a process chamber capable of having an inside pressure thereof reduced;

a process gas supply unit for supplying gas to said process chamber;

a specimen table for holding a specimen;

a vacuum pumping unit; and

a monitor unit;

wherein said monitor unit enables monitoring of a temperature of an inner wall of said process chamber one of before starting plasma processing of a specimen and after finishing a cleaning operation.

29. A plasma processing apparatus according to claim 28, wherein said processing apparatus further comprises an inner wall temperature setting unit for setting in advance a temperature of the inner wall in response to a plasma processing condition for the specimen, and a monitor temperature inputting unit.

30. A plasma processing apparatus comprising:

a plasma generating unit;

a process chamber capable of having an inside pressure thereof reduced;

a process gas supply unit for supplying gas to said process chamber;

a specimen table for holding a specimen;

a vacuum pumping unit;

a cleaning unit; and

a monitor unit;

wherein said cleaning unit enables a cleaning operation of said process chamber under utilization of a plasma for gas for cleaning at least one of before plasma processing for a specimen, during the plasma processing for a plurality of specimens and after the plasma processing for the specimen; and

wherein said monitor unit enables monitoring of a temperature of an inner wall of said process chamber after the cleaning operation and before starting the plasma processing for the specimen.

31. A plasma processing apparatus according to claim 30, wherein said processing apparatus further comprises an inner wall temperature setting unit for setting in advance a temperature of the inner cylinder in response to a plasma processing condition for the specimen, and a monitor temperature inputting unit.

32. A plasma processing apparatus comprising:

a plasma generating unit;

a process chamber capable of having an inside pressure thereof reduced;

a process gas supply unit for supplying gas to said process chamber;

a specimen table for holding a specimen;

a vacuum pumping unit;

a monitor unit; and

a plasma processing interruption unit;

wherein said monitor unit enables monitoring of a temperature of an inner wall of said process chamber; and

wherein said plasma processing interruption unit enables interruption of plasma processing for the specimen in response to the monitored inner wall temperature.

33. A plasma processing apparatus according to claim 32, wherein said processing apparatus further comprises an inner wall temperature setting unit for setting to input a temperature of the inner wall in response to a plasma processing condition for the specimen, and a monitor temperature inputting unit.

34. A plasma processing apparatus comprising:

a plasma generating unit;

a process chamber capable of having an inside pressure thereof reduced;

a process gas supply unit for supplying gas to said process chamber;

a specimen table for holding a specimen;

a vacuum pumping unit;

a cleaning unit; and

a monitor unit;

wherein said cleaning unit enables a cleaning operation of said process chamber under utilization of plasma of gas for cleaning during processing of a plurality of specimens when the plurality of specimens are processed one by one in a continuous manner; and

wherein said monitor unit enables monitoring of a temperature of an inner wall of said process chamber after the cleaning operation and before starting the plasma processing for the specimen.

35. A plasma processing apparatus according to claim 34, wherein said processing apparatus further comprises an inner wall temperature setting unit for setting in advance a temperature of the inner wall in response to a plasma processing condition for the specimen, and a monitor temperature inputting unit.

36. A plasma processing apparatus comprising:

a plasma generating unit;

a process chamber capable of having an inside pressure thereof reduced;

a process gas supply unit for supplying gas to said process chamber;

a specimen table for holding a specimen;

a vacuum pumping unit; and

an alarm unit;

wherein said alarm unit enables generation of an alarm in response to a detected monitoring temperature at an inner wall of said process chamber.

37. A plasma processing apparatus according to claim 36, further comprising a monitor unit for monitoring temperature of the inner wall and providing an output of the detected monitoring temperature.

38. A plasma processing apparatus according to claim 37, wherein said processing apparatus further comprises an inner wall temperature setting unit for setting in advance a temperature of the inner wall in response to a plasma processing condition for the specimen, and a monitor temperature inputting unit.